

CLAIMS

1. An exhaust gas control apparatus for an internal combustion engine, including a particulate filter (6) which is provided in an exhaust passage (5) of an internal combustion engine (1); a supercharger (3) which is provided in an intake passage (2) of the internal combustion engine (1); an intercooler (4) which is provided in a portion downstream of the supercharger (3) in the intake passage (2); filter recovery means for recovering a trapping ability of the particulate filter (6) by increasing a temperature of the particulate filter (6); and load obtaining means for obtaining a load of the internal combustion engine (1), characterized by further comprising:

EGR control means for causing exhaust gas to flow back from a portion downstream of the particulate filter (6) in the exhaust passage (5) to a portion downstream of the intercooler (4) in the intake passage (2) in a case where a load of the internal combustion engine (1) is equal to or lower than a predetermined load, and for causing the exhaust gas to flow back from the portion downstream of the particulate filter (6) in the exhaust passage (5) to a portion upstream of the supercharger (3) in the intake passage (2) in a case where the load of the internal combustion engine (1) is higher than the predetermined load, while the trapping ability of the particulate filter (6) is being recovered.

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2. The exhaust gas control apparatus for an internal combustion engine, according to claim 1, characterized by further comprising:

a first EGR gas take out pipe (7) which is connected to the exhaust passage (5) at the portion downstream of the particulate filter (6);
25 a second EGR gas take out pipe (8) which is connected to the exhaust passage (5) at a portion upstream of the particulate filter (6);

a first EGR gas supply pipe (12) which is connected to the intake passage (2) at the portion upstream of the supercharger (3);

a second EGR gas supply pipe (13) which is connected to the intake passage (2)

at the portion downstream of the intercooler (4);

a common EGR gas pipe (10) whose one end is divided into two portions one of which is connected to the first EGR gas take out pipe (7) and the other of which is connected to the second EGR gas take out pipe (8), and whose other end is divided into
5 two portions one of which is connected to the first EGR gas supply pipe (12) and the other of which is connected to the second EGR gas supply pipe (13);

a first three-way valve which is provided at the one end of the common EGR gas pipe (10); and

a second three-way valve which is provided at the other end of the common

10 EGR gas pipe (10), wherein

while the trapping ability of the particulate filter (6) is being recovered, in the case where the load of the internal combustion engine (1) is equal to or lower than the predetermined load, the EGR control means controls the first three-way valve (9) so as to provide communication between the first EGR gas take out pipe (7) and the common
15 EGR gas pipe (10), and controls the second three-way valve (11) so as to provide communication between the second EGR gas supply pipe (13) and the common EGR gas pipe (10), and in the case where the load of the internal combustion engine (1) is higher than the predetermined load, the EGR control means controls the first three-way valve (9) so as to provide communication between the first EGR gas take out pipe (7) and the
20 common EGR gas pipe (10), and controls the second three-way valve (11) so as to provide communication between the first EGR gas supply pipe (12) and the common EGR gas pipe (10).

3. The exhaust gas control apparatus for an internal combustion engine, according

25 to claim 2, characterized in that the common EGR gas pipe (10) is provided with an EGR cooler (16), a bypass passage (17) that bypasses the EGR cooler (16), and a passage switching valve (18) that stops one of a flow of the exhaust gas through the EGR cooler (16) and a flow of the exhaust gas through the bypass passage (17); and while the trapping ability of the particulate filter (6) is being recovered, in the case where the load

of the internal combustion engine (1) is equal to or lower than the predetermined load, the EGR control means controls the passage switching valve (18) so as to stops the flow of the exhaust gas through the EGR cooler (16), and in the case where the load of the internal combustion engine (1) is higher than the predetermined load, the EGR control
5 means controls the passage switching valve (18) so as to stops the flow of the exhaust gas through the bypass passage (17).

10 4. The exhaust gas control apparatus for an internal combustion engine, according to any one of claims 1 through 3, characterized in that the load obtaining means obtains the load of the internal combustion engine (1) based on an accelerator pedal operation amount (ACCP) of a vehicle.

15 5. The exhaust gas control apparatus for an internal combustion engine, according to claim 4, characterized in that the load obtaining means determines that the load of the internal combustion engine (1) is high when the accelerator pedal operation amount (ACCP) is larger than a predetermined amount (D), and determines that the load of the internal combustion engine (1) is low when the accelerator pedal operation amount (ACCP) is equal to or smaller than the predetermined amount (D).

20 6. The exhaust gas control apparatus for an internal combustion engine, according to claim 1, characterized in that while the trapping ability of the particulate filter (6) is not being recovered, the EGR control means causes the exhaust gas to flow back from a portion upstream of the particulate filter (6) in the exhaust passage (5) to the portion downstream of the intercooler (4) in the intake passage (2).